LA BOURBOULE

DR. G. H. BRANDT

With the Author's Compliments.

THE

ARSENICAL SPRINGS

AT

LA BOURBOULE

AUVERGNE

BY

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CONTENTS.

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LA BOURBOULE, AUVERGNE.

SITUATION AND HISTORY.

THE mineral springs of la Bourboule, perhaps the most important in Europe, are situated in the wide and open valley of la Dordogne, in the middle of the Mont Dore group of mountains about four miles from the baths of that name, and on the borders of the Dordogne river; its altitude is about 2,600 feet above the level of the sea, surrounded as it is by undulating hills, and green slopes, full of pure air and light, and protected from the North winds, makes this station a most desirable one for many purposes.

The access to these springs is much easier since the opening of the railway station at Laqueille, on the Paris branch line to Tulle and Bordeaux. The

drive from the station takes about an hour, through some of the most lovely scenery of that region.

These springs were known several centuries ago, as we see by a description in 1540 of a rudimentary bath, in which patients from an infirmary in the hamlet of la Bourboule used to bathe at that time, and for many years after, and even until less than a century ago, the people from the surrounding country used to travel on horse back over almost intractable roads, bringing their beds and food, to seek in these springs relief to their ailments. These patients had to live in miserable huts, and were obliged to endure severe privations, nevertheless, they were thankful for the great benefits received, most of them returning home greatly relieved or cured of their ailments. The reputation of these springs was for a long time limited to the region of Auvergne, and it is only since a comparatively recent date, that new springs were discovered, and better accommodations were supplied. In a few years the humble village was transformed into one of the most flourishing thermal stations in France. In 1865 only 600 patients were treated at la Bourboule;

in 1877 the number increased to 2,800. In 1878 a most unfortunate contention took place between the company and Dr. Chaussy, who had a private bathing establishment of his own, it was a struggle for mineral water, and for life, which fortunately for all parties and the public, concluded by an amicable arrangement, not, however, without serious loss to himself and the company. The springs are now under one administration, in full play, and supply the bathing establishments with an immense quantity of pure mineral waters.

SPRINGS.

The old springs, which existed formerly, have now been reduced to three, by special works directed towards obtaining a larger supply of mineral water, free from any mixture with infiltrated plain water. Owing to the persevering labour of M. Perrière the great source to which he gave his name was discovered, and supplies the bathing establishment with a large amount of mineral water at a temperature of 140° F. The two other springs, *Sedaiges* and *la Plage*, also afford a supply of one hundred gallons per minute, their temperature being for the first 91·4° F. and 86° F. for the second. The water of these two springs is most valuable, not only for drinking purposes, but also for graduating the temperature of the great Perrière spring. The advantages of reducing the temperature of a hot mineral water with water of the same kind but of a lower temperature, are obvious; nothing is lost by evaporation, and it retains its active principles unaltered.

Strange to say, the extraordinary cures per-

formed by these waters for so many years only attracted the attention of chemists in 1853 when the celebrated chemist Thenard, surprised at their marvellous effects, investigated the cause, and discovered the presence of arsenic in medicinal dose.

The following analysis made by Messrs. Lefort and Bouis in 1878, shows the mineral substances in solution in a litre of water of the three springs.

Analysis of the Mineral Springs at la Bourboule.

Substances dissolved in a litre of water.	Perrière Spring.	Sedaiges Spring.	La Plage Spring.
Carbonic acid, free and combined . . .	1·7654	1·4982	1·2957
Hydrochloric acid . .	1·8517	1·7122	1·1161
Sulphuric acid . . .	0·1175	0·1035	0·0691
Arsenious acid . . .	0·01081	0·0054	0·0029
Silicic acid . . .	0·1200	0·1175	0·0011
Arsenic	"	"	"
Soda	2·4121	2·2580	1·3997
Potash	0·1025	0·0921	0·0780
Lithia	Indicated	Indicated	Indicated
Lime	0·0739	0·0725	0·0541
Magnesia	0·0135	0·0102	0·0075
Alumina	Traces	Traces	Traces
Oxide of iron . . .	0·0021	0·0018	0·0007
Oxide of manganese . .	Traces	Traces	Traces
Organic matter . . .	Indicated	Indicated	Indicated
TOTAL	6·46951	5·87654	4·12525
FIXED RESIDUE . .	4·9380	4·5280	2·9260

Saline combinations contained in a litre of water by calculation.

Names of dissolved substances.	Perrière Spring.	Sedaiges Spring.	La Plage Spring.
Free carbonic acid . .	0·0518	0·1662	0·2660
Chloride of sodium . .	2·8406	2·6102	1·7011
Chloride of potassium .	0·1623	0·1427	0·1235
Chloride of magnesium .	0·0320	0·0243	0·0180
Chloride of lithium . .	Indicated	Indicated	Indicated
Bicarbonate of soda. .	2·8920	2·1106	1·6265
Bicarbonate of lime. .	0·1905	0.1501	0·1390
Sulphate of soda . .	0·2084	0·1780	0·1231
Arseniate of soda . .	**0·0287**	**0·02776**	**0·00776**
Peroxide of Iron . .	0·0021	0·0018	0·0007
Silicic acid . . .	0·1200	0·1170	0·1000
Alumina	Indications	Indications	Indications
Organic matter . .	Traces	Traces	Traces
TOTAL	6·4997	5·5009	4·0979
TEMPERATURE CENTIGRADE	60°	32°·5	25°·5

PHYSICAL PROPERTIES AND CHEMICAL COMPOSITION.

THE mineral water from the Perrière spring has a slightly saltish and alkaline taste, it is limpid, unctuous, and odourless; it throws down no deposit when properly bottled and corked. When seen in a large mass as in the Piscine, and after exposure to the air, having lost a part of its carbonic acid, it presents an opaline tint, and its surface gets covered by an irridescent film; this film or pellicle, according to M. Lefort is formed by an organic matter of a bituminous nature. The temperature of the water at its surface is 56°·0 C. (132°·8 F.) and at the bottom of the well 60° C. or (140° F.); the quantity of water supplied by this spring is equal to 388 litres (quarts) per minute. This enormous amount of water supplies the whole of the establishment in its different applications.

The waters produced by the Sedaiges and la Plage springs present the same qualities as those

of the Perrière spring; their taste, however, is more acidulous, owing to the larger percentage of carbonic acid which they contain. The poor people often wash their linen in these hot mineral waters, which renders it particularly white, as if bleached; it has also been used for cooking purposes. French beans retain their bright green colour after being boiled in them. These waters do not incrustate the baths and pipes; when left for some time in a vessel they leave a deposit which is extremely unctuous, acid, and soapy to the touch. When drunk at the spring the taste is decidedly saline, but on cooling the acidulous flavour predominates.

CHEMICAL PROPERTIES.

THE first attempts at analysing these waters go as far back as 1670 when Duclos recognized in them the presence of chloride of sodium. Chomel in 1734 found carbonate of soda, and Lemonier in 1744 admitted that they contained sea salt, and Glauber's salt. Michel Bertrand also investigated these mineral waters. Henri Lecoq was the first, however, to make as nearly as possible an analysis of them which he published in 1828 in the *Annales de l'Auvergne.*

Thenard in 1853 also analysed them, and was the first to dose the amount of arsenic contained in them. In 1856 M. Gonod discovered in the sediments of these springs the presence of Iodine, and his experiments were confirmed later on by M. Lefort; who published in 1862 in the *Annales de la Société d'Hydrologie* a complete analysis of these waters. M. M. Henri and Carnot also studied the composition of the Bourboule springs. Finally, in 1878, Messrs. Lefort

and Bouis were entrusted by the Academy of Medicine with the examination of the Perrière, Sedaiges, and la Plage springs, the result of their work is found in the table of analysis above transcribed.

Some medical men, probably of rival stations, have pretended that these waters obtain their mineralisation from the sedimentary formations through which they pass before reaching the surface, in consequence of which their properties would vary from time to time, such, however, is not the case; it is proved that they proceed with all their elements from under the cristaline rocks which form the solid crust of the earth, and that the sedimentary formations are in a great measure produced by the waters themselves, and deposited by them. As regards the origin of the arsenic contained in them I will quote the opinion of one of the greatest *savants* living, Professor Berthelot. In a letter addressed by him to one of the directors of la Bourboule, he says: "The conclusion at which I have arrived, after perusal of the documents and researches, is that the soluble arsenic contained in the Bourboule springs takes its origin from the

interior of the earth, it is brought up in the waters through the fissures in the granite, and it is not produced by their contact with disintegrated earth, schistes, and other materials situated above the granite."

M.M. Garrigou and Jules François are of the same opinion as Professor Berthelot. M. Elie de Beaumont expresses the same opinion in his very remarkable report on subterraneous waters. It was owing to his faith in the opinions emitted by such competent men of science that M. Perrière's soundings were made through the granite formation, at a depth of 75·60 centimetres, or 250 feet below the surface of the earth, where he found the pure arsenical water.

Besides these reasons, the arsenic which is found in the sedimentary deposits is in the form of an insoluble salt of iron, which was evidently deposited there by the arsenical water, as it rose from the sub-granitic region, this water after having abandoned part of its salt, and arriving in the well is no longer in the condition necessary to transform it into a soluble alkaline arseniate, it is no longer compressed, and contains much less car-

bonic acid. This water, therefore, owes its most important properties to the arseniate of soda, which it contains at its origin under the granitic formation.

We have, therefore, before us a hot mineral water containing nearly 7 grammes or 105 grains of solid substances, of these 7 grammes, there is 1 gramme of free carbonic acid, of the remainder, nine-tenths are salts of soda, with potash in a fair proportion, as also traces of ammonia and lithia, there is also to be found lime, magnesia, and alumina, a small quantity of iron and organic matter (bituminous). The three predominent acids are those of arsenic, chlorine and carbonic, the principal salts are, therefore, arseniates, chlorides, and carbonates.

The arseniates play the most important part in this water, owing to the powerful action they possess in a small volume, and in a proportional large dose, as they are found in the Bourboule water; no other mineral water known contains such a large proportion. The chlorides represent about one half of all the mineral elements, and the carbonates about one third, so that if we wished

to give it a name according to its predominant physical and mineral characters, we should call it a "thermal alkaline, arsenical, chlorinated, bicarbonate gaseous water." The late and much lamented Professor Gubler classified it as a *Protogeic* water, in opposition to those which he designated *Strategeic*, and *degenerated* the first from πρῶτος (first) and γῆ (earth) are formed in the primitive formation, that is to say, at the greatest depth, where they find the highest amount of heat, pressure, and chemical activity, those, therefore, which possess the most perfect composition.

The *Strategeic* are those which get mineralised as they pass through strata of sedimentary formation, and which are consequently only tepid or cold.

The degenerated are those which have a variable mineralisation at their origin, and which get modified (degenerated) as they reach the surface of the earth.

BATHING ESTABLISHMENTS AND MEDICAL APPLIANCES.

THE bathing establishments are three in number. The Mabru establishment, for third class patients only. The Chaussy establishment, almost entirely used by second class patients, and the new establishment, or Thermae, for first class patients.

The Mabru establishment contains twenty-nine baths, a room for the foot baths, a pulverisation room, and a buvette or drinking stall. The baths are made of enamelled iron, like those in the other establishments. In each bathing room, and attached to each bath there exists an apparatus for local douches. The mineral water used in these baths, comes directly from the Perrière spring, or from the two reservoirs constructed in the Parc Fenestre, which contain each 450 cubic metres. The douches are supplied with water from special reservoirs placed above the establishment galleries, and into which mineral water can at any time be pumped at the temperature re-

required for the douche. The Chaussy establishment is attached to the former one; although of an irregular shape it is well arranged. The bathing rooms are on the first and the ground floor, on this last there are forty-two bathing rooms with forty-eight baths. At the Western angle of the building, opposite the principal entrance, there is a large square hall with a *buvette* in the centre, round this hall there are other bathing rooms, and an inhalation room, also a *Piscine*, which will hold from twenty-five to thirty bathers; besides these there are rooms for water and steam douchès, the ticket office, the heating room for linen, and the staircase leading up to the first floor, here also are fifteen bathing rooms with twenty-one baths, a large pulverising room, and two smaller ones at the east end, all these are spacious, well ventilated, and with plenty of light.

The new establishment is specially adapted for first class patients, it is situated in the centre of la Bourboule, on one side of the Dordogne, as will be seen by referring to our engraving it forms a vast rectangle with a Pavillion at each angle surmounted by a dome; these Pavillions are con-

nected two by two lengthways following the long sides of the rectangle, and parallel to the river, by a superb gallery which crosses another Pavillion constructed in the centre of each front side of the building, these two galleries with bathing rooms on each side, are, one for males, the other for females. The Pavillions at the extreme angles are disposed for the inhalation rooms, heating rooms, ascending douches, and cloak rooms. The small sides of the rectangle are arranged for the pulverising rooms, and aspirations, male and female, foot baths and cloak rooms. The two large Pavillions at the centre of each façade are occupied by the offices, etc., and are connected by a vast transversal gallery used as a promenade and conversation room with a *buvette* in the centre; each side of this central gallery is fitted up with rooms for hydrotherapy, the strong douches, and massage. Each bathing room contains an iron enamelled bath, with a douching apparatus for hot and cold water. The water reaches each bath and douche under the pressure of 11 metres or 33 feet. Some of the bath rooms, called *de luxe*, are provided with a saloon. The other bath rooms

have an ante chamber, which serves as a dressing room, the rooms for the pulverisations are spacious, and contain each, twenty-one apparatuses with tubes of adjustment, etc., forming a very complete arrangement. In the *grande douche* rooms every apparatus of most varied and perfect for horizontal douches, showers of different sizes, circular douches, (with or without shower), ascending douches, dorsal and vaginal, and the wet massage.

Scottish douches, and all hydrotherapeutic appliances, as well as the dry massage are well carried out. Throughout the establishment there is a profusion of air and light. The walls are covered with handsome fresco paintings of vivid colours, and graceful designs. Most of the methods of applying mineral and plain water in thermal establishments, are very similar, there is, however, one at la Bourboule which I have not seen elsewhere, it is the inhaling room where the hot mineral water is made to descend from a great height through a tube with a huge rose at the end; the water is made to fall on a wooden disc of about six feet in diameter, placed in a cir-

cular reservoir, and round which the patients are seated. The water falling from a great height on the disc, is transformed into vapour and pulverised water; this system seems to be very perfect, inasmuch as all the constituents of the mineral water are finely divided, and made fit for inhaling at an agreeable temperature.

DISEASES TREATED AT LA BOURBOULE.

THE mineral composition of this water, its high thermality, and the large percentage of arsenic in the form of arseniate of soda, makes it unique of its kind among the many mineral springs in Europe. Professor Gubler when studying the composition of these waters, found that a great similarity existed between it and that of the mineral components of the blood plasma, this gave rise to the name given to it of a *mineral lymph of the blood*, or a *chemical food*, supplying to the blood that which in many diseases is found deficient; under this aspect it is administered in those cases where repair is called for, the experiment in a vast number of cases which have undergone the treatment at la Bourboule seems to justify this theory. From the year 1825 to 1854 the only physician who practised at la Bourboule, was old Dr. Chaussy, uncle to Dr. Chaussy who died last year, after a painful and severe struggle with the

company which now possesses all the springs at this station; the old doctor left a statistic of 4300 cases which were treated during that period of 29 years. Nine tenths of those cases were scrofula, rheumatism and gout. The treatment was chiefly directed against the cutaneous, osseous, and articular manifestations; neuralgia (particularly sciatica) and some cases of paralysis. One of the springs called "*La source des Fièvres*" was held in high repute for the cure of intermittent fevers, and the lesions which they generally leave after them.

Since that epoch new experiments were made by Dr. Guéneau de Mussy in 1866 with water taken from the spring, in cases of disease of the respiratory organs, and more particularly in Phthisis, they were afterwards tried in cases of defective nutrition as a tonic, and in these with marked success. The important results obtained by Dr. de Mussy were made known in various ways, and particularly in one of his clinical lectures dedicated entirely to the effects of these waters in phthisis, afterwards published in the *Bulletin Generale de Therapeutique.* The year after, Dr. Bazin repeated at the St. Louis hospital

what Dr. de Mussy had done at the Hotel Dieu, applying them in cutaneous diseases in which he derived considerable and important results, these examples were afterwards followed in hospitals and private practice, by Drs. Fremy, Gubler, Cazalis, Martin Damaurette, Clerc, and others. Following these experiments, numerous patients were sent to la Bourboule to undergo treatment at the springs, and very shortly the number became so great that the small establishment then existing did not suffice to contain them. As the reputation of la Bourboule increased, so did the number of patients until the new establishment was built, which may now be considered the largest and best arranged in France. The diseases in which arsenic, in the shape of arseniate of soda, plays such an important part are anæmia, chlorosis, certain forms of cutaneous diseases, malarial cachexia, chronic syphilis, and last but not least in struma and all its varieties, in tuberculosis and certain forms of lung diseases, in lymphatic individuals affected by a slow form of phthisis, where circumscribed indurated spots are detected by percussion and auscultation, in fact where caseous deposits, or

internal scrofula exists, these waters are most valuable, and very many successful cases have been recorded. In bronchial catarrh these waters taken internally with warm milk, and inhaled in the shape of spray, have produced remarkable effects. I have had many opportunities of testing the effect of these waters kept in bottle in bronchial affections, and have found them answer admirably. In cutaneous diseases the results are often marvelously rapid provided there be no gouty habit, but in these cases, after a treatment at Royat, an after cure at la Bourboule acts like a charm. Cases of asthma, emphysema, and dilatation of the bronchi do well under the spray inhalation, taking the water internally at the same time.

In nervous and neuralgic complaints, such as chorea and sciatica, these waters applied locally in the shape of douches, and taken internally, act most beneficially. In diabetes and glycosuria these waters have a decided effect. My friend and able colleague, Dr. Worms of Paris, has reported to me several cases of improvement under treatment at la Bourboule. In children who have

unfortunately inherited disease, and in whom lymphatism and scrofula show themselves in some shape or another, these waters act very rapidly; this seems to justify Isnard's remark that children tolerate arsenic better than adults.

PHYSIOLOGICAL EFFECTS.

As a rule the mineral water of la Bourboule, when taken internally alone, is well tolerated by the stomach, some robust countrymen can take large quantities without feeling any disturbance, those, however, who suffer in any way from atonic dyspepsia require to be careful, beginning with small quantities and gradually increasing as the stomach regains tone, and power of digestion. The first effect in these cases is an excitation of the stomach, and intestinal mucous membrane; this is rather an advantage when carefully watched, as it increases the appetite, and allows them to digest more perfectly. In other cases the reverse symptoms are noticed, the water is hardly digested, and lies heavily on the stomach, this happens to those who take the water cold; in these cases a few doses at the spring generally sets them up at once. Those patients who are anxious to get well quickly, and who think that large doses act more readily than moderate ones, often get chronic indigestion,

it then acts on the intestines as well, and produces diarrhœa. Patients coming for an after cure from certain stations such as Luchon, and Chatel-Guyon, and who begin treatment too soon, generally have diarrhœa; in children these symptoms are particularly noticeable. If the cure is prolonged beyond toleration, it will suddenly be followed by a general derangement of the nervous and circulatory systems, as also of the digestive organs, the patients suddenly loose their appetite, they cannot digest their food, the tongue becomes coated, and diarrhœa supervenes, they will also at times complain of malaise, heaviness of the head, and weakness. Sleep is often broken by nightmare, the pulse becomes small and frequent; all these symptoms disappear as soon as the water is stopped, should, however, it be taken again, even after several days of repose, the whole train of bad symptoms reappears. This is a sure sign that the system is saturated with mineral water, and that the treatment must end there.

LIVER.

THE action of these waters on the liver requires special attention. Dr. Garrod in his work on gout, etc., mentions the effect of arsenic on the liver, and remarks that it produces at times congestion, and even a true inflammation of that organ; at la Bourboule some cases are on record in which similar symptoms have been noted, but it has been found that simultaneously, the skin, kidneys, or lungs were not acting properly. It is, therefore, prudent to watch the liver when administering these waters in the same way that one watches the gums when giving mercury. This peculiar action of arsenic on the liver might, we think, be taken advantage of in certain affections, of that organ.

On the circulation and nutrition. The effects of external applications in the shape of douches and hot baths are the same as those produced by any other water (those containing a large amount of carbonic acid gas excepted) these effects consist

chiefly in exciting the central organs of circulation, heart, and large vessels, and are the consequence of temperature and percussion, and must not be attributed to any particular virtue of the mineral water; this action is only to be taken into account whilst the patient is taking the mineral waters internally, as it renders their action more or less powerful. This increase of power is noticeable in the small vessels, and in the capillaries, as also in the phenomena of nutrition, these symptoms show themselves at about the same time as those on the stomach already mentioned. The patients at that time feel a sensation of heat at the extremities and face, if they happen to have any lesion of a congestive or hæmorrhagic tendency their symptoms increase, the acnea rosacea gets purple, and the patient feels a sensation of extreme heat on the face. Those suffering from chronic pharyngitis, complain of heat and dryness in the throat obliging them to drink frequently. In laryngeal affections the voice becomes harsh, catarrh of the pharynx and bronchi becomes less humid, and at times traces of blood may be detected in the sputa; in all cases where congestive,

or inflammatory symptoms are likely to appear a close supervision is required, and it must always be borne in mind that la Bourboule is at an altitude of 2600 feet, that its waters taken internally are exciting, and that their thermality must be taken into account when applied in the shape of baths and douches. When these symptoms of excitation have subsided the patient enters into the period of tolerance, which is soon followed by the phenomena of resolution, during this period most of the symptoms, whether they be cutaneous catarrhal, articular, or others, begin to mend; at this time particular attention is required, as the patient becomes very susceptible to relapses if due care is not taken with the quantity of water imbibed. The increase in weight is also one of the symptoms noticed whilst under the influence of these waters.

NERVOUS SYSTEM.

PATIENTS suffering from excessive irritability of the general nervous system, or from special affections, as neuralgia, spasm, choreic convulsions, epilepsy, dyspnœa, migraine, insomnia, etc., allied to an anæmic or cachectic condition, after being under treatment for some time, find improvement probably owing to the tone-giving properties of these waters. The physician must, however, be cautious in their administration, as they require to be given very gradually so as to avoid any increase of excitation.

SKIN.

THE first effects of these waters on the skin, whether applied as a lotion, bath, douche, or spray, is to cleanse the skin of crusts, scales, dirt and parasites; the general feeling is very pleasant

and agreeable owing to the unctuous, and limpid properties of the water, which at the same time whitens the skin and renders it very supple. Parasitic affections, such as tinea tonsurans, favus, and several others yield to the prolonged treatment either by the direct influence of the water on the skin, or by its tonic properties on the organisation, rendering it less apt to be infected.

The effect of this water on abraded surfaces, such as excoriations, ulcers, etc., is remarkable, as they dry up with astonishing rapidity. Dr. Chaussy has noted down two cases in which the perspiration of patients under treatment had a strong smell of garlic, and Dr. Martin Damaurette perceived the same odour in the breath of another patient. Some very delicate females after the first few baths feel a sensation of tingling all over the body, somewhat like the effect produced by faradisation, this phenomenon lasts but a short time, though in one case I saw it persist for several days. In some cases of skin diseases of a purely pruriginous character, such as prurigo, urticaria, lichen and particularly eczema, the itchy sensation increases to such an extent as to become in-

tolerable, the treatment has then to be suspended. The particular Hyperæsthesia which is found to exist on cicatricial deformities often diminishes, and sometimes disappears altogether; similar symptoms which have been occasionally observed on scrofulous and syphilitic ulcers improve considerably.

EFFECTS PRODUCED ON THE FUNCTIONS OF THE RESPIRATORY ORGANS.

In individuals with sound lungs, who may be under treatment at la Bourboule no appreciable effect is noticed, if, however, there be any latent congested spots, after a few days treatment (four to five) the congestion is apt to increase, hæmoptysis sets in, or is increased in those cases which had a tendency to blood-spitting, in such individuals extra care is necessary, and as a rule no ill consequences are felt; after this *congestive stage* has passed off the patient feels considerably better, old congested patches disappear as also increased vocal resonance, the respiratory murmur becomes clearer, breathing power is more ample and expansion greater; as these symptoms dissappear, so do also cough dyspnœa, and those painful sensations which often prevent patients from taking certain positions; these pains after a few baths generally increase but soon follow the same steps of the other symptoms, to disappear altogether. Those

persons who from a delicate constitution have a tendency to acquire sore throats during the cold and damp season, seem to get hardened, and lose that peculiar predisposition after a cure at la Bourboule.

Others who suffer from dyspnœa, breathe more freely and deeply, after drinking and inhaling these waters. This last observation requires a remark to be made. When symptoms of dyspnœa manifest themselves in individuals of a plethoric condition, and subject to congestive phenomena, a close watch must be kept whilst they are taking the waters, otherwise we might see inflammatory symptoms make their appearance, and the treatment would have to be suspended at all events for a time.

COUNTER INDICATIONS.

ALL medicines, however good they may be, cannot be applied indiscriminately to all diseases, and to all subjects, otherwise they would become panaceas of no value, and consequently fall into disuse. La Bourboule waters being strongly mineralised with a toxic substance, requires above all others to be carefully noted down as a powerful remedy, and therefore, requires particular care in the way it is administered, and like all mineral waters more so at the springs, than when employed at a distance and kept in bottle.

The first general rule to be observed before prescribing, and particularly during their application, is never to allow them to be used during the acute stage of an illness. Acting, as we have noticed above, as a powerful stimulant to the nervous system, they increase cardiac action, accelerate the circulation, and may cause *thermal fever*.

In cases of phthisis with hæmorrhagic tendency these waters should be forbidden, not so, however,

in those cases of caseous pneumonia, in which with care they may be beneficial.

In cardiac diseases la Bourboule waters should be strictly avoided, not only from the too great stimulus afforded by them when applied by percussion externally, but also from the too great fluidity of the blood produced by the internal use of arsenic and alkalies. Particular care is to be observed in delicate children, aged persons, and all those who are convalescing from prolonged illness, in many of these, however, with proper care and management much benefit can be derived.

CLIMATE.

SITUATED in the centre of France in a wide and open valley, close to the picturesque river la Dordogne, and sheltered by the Mont Dore range of mountains, la Bourboule enjoys a delightful climate, its altitude, 2600 feet above the level of the sea, gives it a mild though bracing temperature, the thunderstorms which are of frequent occurrence at its neighbour, Mont Dore, are also felt at la Bourboule in a mitigated form, its sheltered position renders it less cold and damp than Mont Dore, and in a hygienic point of view its cleanliness far surpasses that of its neighbour. The greater equality of its temperature is an important factor, and much to be appreciated by those invalids who are taking hot baths, and inhaling warm spray, as they do not run so much risk in taking cold, and do not require to undergo the extreme precautions which are enforced on those at Mont Dore; owing to this more temperate climate, and enjoying, as it does, a greater amount of fine weather, invalids can venture with more security on the numerous excursions which this interesting valley affords.

EXCURSIONS.

NUMEROUS excursions can be made by rail, carriage, horse or walking; among the most interesting are Mont Dore and its springs, Lac Chambon, St. Nectaire and its mineral springs, Lac Pavin, Pic du Sancy. The cascades of Queurille, Rossignolet and Serpent, Valley of la Cour, Gorge d'Enfer, Salon and Pic du Capucin, and by rail to Clermont Ferrand; Royat, and Puy de Dome.

ACCOMMODATION AND AMUSEMENTS.

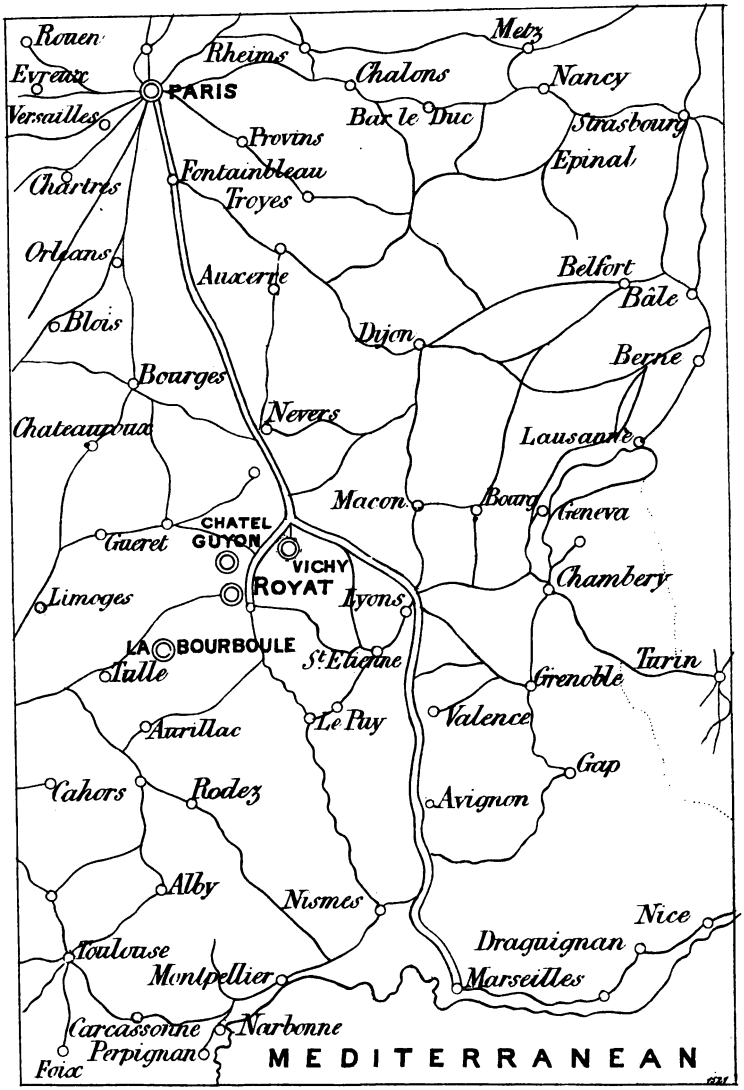
LA BOURBOULE is abundantly supplied with Hotels and Boarding Houses as also numerous private villas.

Food is good, and plentifully supplied at the tables d'Hotes; prices vary from ten to twenty francs per diem; like all watering places, it has

its Casino, with Theatre, Reading-rooms, Billiard and Card-rooms. Dramatic performances alternating with musical entertainments every evening. At the entrance of the Park the amateur will find a shooting gallery and divers amusements for children.

ALTITUDE OF DIFFERENT PEAKS AND PLACES OF INTEREST.

	Feet
Pic du Sancy	5658
Puy Ferrand	5565
Puy de Cacadogne	5391
Rock of Cuzeau	5172
Plateau of Borat	4506
Pic du Capucin	4413
Puy de Dome	4404
Meeting of the Dore and Donge	4041
Hamlet of Diana	3999
Lac de Guery	3714
Lac Pavin	3581
Mont Dore Baths	3135
Laqueille	3039
Chateau de Murols	2813
Lac Chambon	2640
La Bourboule	2556
Clermont Ferrand	1230



The Paris Lyons and Mediterranean Railway Line.